

**REMARKS**

Claims 1-18 and 22-24 are pending in this application, claims 19-21 having been cancelled and claims 22-24 being newly added by the above amendment. Of these claims, claims 1-18 stand rejected under 35 USC §102(e) as being anticipated by Nishida et al.; claims 1, 3-6, 11 and 13-16 stand rejected under 35 USC §102(e) as being anticipated by Niu et al.; and claims 21 and 12 stand rejected under 35 USC §103(a) as being unpatentable over Niu et al. in view of Nishida et al.

In view of the preceding amendments and the following remarks, these rejections are traversed, and reconsideration of this application is respectfully requested.

The Examiner has required restriction between Group I, claims 1-18, drawn to a fuel cell/bipolar plate, classified in class 429, subclass 34, and Group II, claims 19-21, drawn to a method of making a bipolar plate, classified in class 72, subclass 254. Applicant hereby affirms the election of Group 1, claims 1-18. Claims 19-21 have been cancelled by the above amendment.

Applicant's invention is directed to extruded bipolar plates for a fuel cell. As discussed in Applicant's background section, bipolar plates for fuel cells are currently typically made by stamping two separate plates and then welding them together to define the flow channels required for the fuel cell. This process has the drawbacks in that it is labor intensive and makes the plates prone to leaks. By extruding the bipolar plates, the labor is reduced and the seal integrity is increased.

By the above amendment, each of the independent claims 1 and 11 have been amended to state that the extruded bipolar plates are extruded metal bipolar plates. Support for this can be found in paragraph [0017] of the Specification. Applicant submits the prior art of record do not teach extruded metal bipolar plates.

U.S. Patent No. 6,893,765 issued to Nishida et al. discloses a polymer electrolyte fuel cell that includes anode-side separator plates 21 and cathode-side separator plates 31. As discussed in column 5, lines 11-23 and lines 46-50, the separator plates 21 and 31 are formed by pressing and stamping processes. It is these bipolar plate manufacturing processes that Applicant is attempting to improve upon, as discussed above. Applicant submits that nowhere in Nishida et al. does it teach or suggest fabricating bipolar plates for a fuel cell by an extrusion process. Therefore, Applicant submits that Nishida et al. cannot anticipate independent claims 1 and 11.

U.S. Patent No. 6,783,702 issued to Niu et al. discloses a polyvinylidene fluoride polymer (PVDF) composite that includes carbon nano-tubes to make the composite electrically conductive. Column 7, lines 55-67 states that the composite can be used to make bipolar plates for PEM fuel cells that includes extruding a PVDF composite sheet. That section of Niu et al. states that “[f]low channels may be engraved between two hot plates, one with a mirror pattern of the front plate channel and the other with a mirror pattern of the back plate channel.” This discussion in Niu et al. does not include forming cooling fluid flow channels within the PVDF composite sheet, but only flow channels at the top and bottom surfaces of the composite sheet. Applicant submits that the extrusion of the PVDF composite sheet for bipolar plates of a fuel cell disclosed by Niu et al. does not teach extruding cooling fluid flow channels extending through a middle portion of the extruded bipolar plate.

As discussed above, independent claims 1 and 11 have been amended to state that the bipolar plates are metal bipolar plates. The PVDF composite taught by Niu et al. is a plastic, not a metal. Metal has the advantages of being highly electrically conductive and suitably durable for the fuel cell environment that a plastic would not

have. Therefore, Applicant submits that Niu et al. cannot anticipate Applicant's independent claims 1 and 11 as amended.

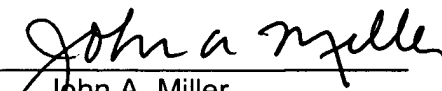
In view of the preceding amendments and remarks, it is respectfully requested that the §102(e) and §103(a) rejections be withdrawn.

New independent claim 22 states that the extruded metal bipolar plates include end recesses for accepting end caps. Applicant submits that neither Nishida et al. or Niu et al. disclose extruding recesses in the ends of the bipolar plates to accept end caps.

It is now believed that this application is in condition for allowance. If the Examiner believes that personal contact with Applicant's representative would expedite prosecution of this application, he is invited to call the undersigned at his convenience.

Respectfully submitted,

By:



John A. Miller

Reg. No. 34985

Phone: (248) 364-4300

General Motors Corporation  
300 Renaissance Center  
P.O. Box 300  
Detroit, MI 48265-3000  
(313) 665-4708

Dated: \_\_\_\_\_

1/26/06